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ABSTRACT

This study investigated how five Australian teachers, who were considered to be exemplary in helping students develop independence, influenced and guided their students to extremely high grades in 12th grade. Teachers were observed teaching a lesson and then interviewed. The interviews asked them to identify successful outcomes of the lesson and to consider the strategies they employed. Overall, teachers had positive attitudes toward their schools and students. They considered being close as a team and having mastery of content knowledge as crucial to their success. Strong positive classroom relationships were an integral feature against which their teaching strategies were enacted. Planning of content and teaching were key aspects of teaching success. All classrooms were nonthreatening, displaying an excellent relationship between teachers and students. Many teachers created a culture in which the Higher School Certificate (HSC) was treated as a kind of game with its own set of rules, though the teachers did not focus on the HSC. Most lessons had two phases, the first being heavily teacher directed and the second involving more independent learning. Overall, teachers encouraged and laid the groundwork for student independence. (Contains 21 references.) (SM)

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EFFECTIVE TEACHING AND STUDENT INDEPENDENCE AT GRADE 12[1]

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A group of teachers, from across the curriculum, were identified as being influential in guiding their students to extremely high marks (in the top 1% of the state) in Grade 12 external examinations. Data collected from interviews and observations indicated that despite the pressure of a high stakes examination, the teachers placed an emphasis on challenging students and having students apply knowledge, rather than 'spoon-feeding' them information. Classrooms were relaxed environments, but highly focused. Fostering student independence was seen as crucial for examination success. In particular, note making, interpretation, application, questioning and group work were common strategies used to develop independence.

Introduction

This paper is based on research by Ayres, Dinham and Sawyer, (2001, 2000), into teachers who were instrumental in guiding their students to achieve extremely high marks (in the top 1% of the state) in Grade 12 external examinations in the state of New South Wales, Australia. The beliefs and classroom practices of these *effective* teachers were studied in order to identify what factors could be attributed to successful teaching at this level, and to what extent the high-stakes testing in Grade 12 affected teaching practices. The main purpose of this paper is to report on one of the main findings of the original study, viz. the ways in which the teachers both encouraged, and laid the groundwork for, student independence in their classrooms. The paper focuses largely on five teachers, drawn from the areas of Mathematics, English, Modern History, Ancient History and Legal Studies, who were considered to be exemplars of the general trends associated with developing independence. What immediately follows is an overview of some of the major findings of the teacher effectiveness literature, which underpinned this study.

Research into effective schools and effective teachers

Since Coleman (see Coleman et al., 1966) and Jencks (Jencks et al., 1972) concluded that schools made little difference to academic outcomes, considerable international research (see Sammons et al., 1995; Mortimore, 1998) has been

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conducted in order to refute their findings. To achieve this goal, many researchers have adopted a *value-added* approach by using longitudinal studies to measure changes in performance (see Rutter et al., 1979; Mortimore, 1998), rather than just outcome measures as used by Coleman and Jencks. Such studies, which have controlled for student intake variables, have been successful in showing that *schools do make a difference* (see Sammons et al., 1995; Mortimore, 1998).

In a review of the effective schools literature, Sammons et al. (1995) identified eleven factors that were commonly observed in effective schools. These factors were: professional leadership; shared visions and goals; a learning environment; concentration on teaching and learning; purposeful teaching; high expectations; positive reinforcement; monitoring progress; pupils' rights and responsibilities; home-school partnership; and a learning organisation. Clearly, many of these factors are dependent upon the effectiveness of teachers.

Over the last three decades, a variety of methodological approaches have been used to collect data on effective teachers. For example, studies, have compared teachers in effective schools with teachers in non-effective schools (see Teddlie, 1994); expert teachers have been compared with novices (see Berliner, 1986; Leinhardt and Greeno 1986; Borko and Livingston, 1989), and students have been used to identify effective teaching practices (see Brown & McIntyre, 1993; Cooper & McIntyre, 1996;. Batten, Marland and Khamis, 1993). Consequently, a vast knowledge base on teacher effectiveness has been constructed, which is constantly extended by major reviews of the research (see Brophy and Good, 1986) and the completion of new projects, such as the recent Hay McBer (2000) study in England. The accumulation of this research has not only provided information about classroom practices, but also revealed much about the personal qualities of effective teachers.

Personal qualities of effective teachers

Hay McBer (2000) identified five clusters of professional characteristics as significant to "outstanding" teachers: professionalism (including respect for others), thinking (analytical and conceptual), planning and setting expectations, leading (flexibility, holding people accountable and a passion for learning), and relating to others (impact and influence on pupils, understanding others). It is clear from this research that a key attribute of effective teachers is the ability to form good relationships with students. This factor has also been identified in many other international studies. For example, an OECD study (1994) into quality teaching, involving eleven countries, found that good teachers have a love of children, know their students as individuals and have a commitment towards helping them learn. Brown and Cooper (1996) found that effective teachers in England developed

personal, mature relationships with pupils. Batten, et al (1993) found in a study with Australian secondary schools that the teacher's attitude towards the students was an important factor in effective teaching. Australian students thought good teachers were friendly and easy to get on with, cared about students and had a sense of humour. It can be seen from these examples that the student-teacher relationship is an important element of effective teaching, and is highly valued by students.

Classroom practices of effective teachers

The extensive research into effective teachers has revealed much about their classroom practices. Some of the main findings associated with classroom climate and teaching skills, most relevant to our study, are reported here. Effective teachers consistently allow their students opportunity to learn through maximising instruction time, keeping lessons on track and focusing on the curriculum (Brophy and Good, 1986; Borko and Livingston, 1989; Hay McBer, 2000). Brophy and Good (1986) found that efficient learning was achieved by covering the curriculum quickly, but progressing in steps which matched the students' capabilities. Effective teachers ensured that students achieved mastery levels in new content areas, which they were able to link to other concepts, and to apply such new knowledge to problem solving. Brophy and Good (1986) also found that effective teachers would provide highly structured teacher-led lessons with an emphasis on reviewing processes. Presentations would be clear and conducted with enthusiasm. Leinhardt and Greeno (p. 93) identified a core of activities that the expert teachers used to structure their lessons. Typically, lessons would progress from presentations and reviews, through shared problem solutions, to interactive seatwork and occasional independent work. Similarly, Borko and Livingston (1989) found that expert teachers obtained a good balance between content-centred and student-centred instruction

Further research by Brown and McIntyre (1993, p. 28) found that effective teachers had classrooms that were relaxed and enjoyable, presented work in a way that was interesting and motivating and provided conditions that enabled pupils to understand. Effective teachers also made clear what pupils were to do and what pupils could achieve, judged what could be expected of a pupil, helped pupils with difficulties, and encouraged pupils to raise their expectations of themselves. To specifically aid learning, Cooper and McIntyre (1996) found that students valued the following strategies (p. 101): story telling, oral explanation by the teacher (often combined with discussion/question answer sessions or use of blackboard); use of pictures and other visual stimuli (for explanation/ information) and drama/role play. With respect to discussion, students found the most successful to be "...those which provided opportunities for autonomous thought and personal expression while being

carefully directed by the teacher." (p. 107). Brophy and Good (1986) also found that questioning played an important role in the classroom. Many questions of the drill-review type would be delivered quickly. More open and difficult questions would be less common, but mainly used to promote higher level thinking. Furthermore, effective teachers were especially adept at responding to student questions and answers. The importance of questioning was also identified in expert/novice research. Borko and Livingston (1989) found that experts were able to use student responses as springboards for discussion, obtaining a good balance between content-centred and student-centred instruction

Overview of the study

Selecting the schools and teachers

The initial aim of the original study (Ayres et al., submitted) was to identify teachers who were instrumental in helping students achieve outstanding results in their Year 12 external examinations. To achieve this, confidential data were obtained from the NSW Board of Studies (BOS[3]) on the top 1% of students for each HSC[4]. course from 1991 to 1996 in all government schools in New South Wales. It was assumed that if students at the same school were performing at a higher level in a particular course than they did in other courses, then the teaching in that course was likely to be a considerable influence. On this basis a number of schools were thus identified. These schools were then compared with each other in order to find the most effective schools on an individual course basis. As a result of this process, thirty-two faculties were identified as being potentially responsible for the outstanding success of their students in particular HSC courses. By locating those teachers who had taught these courses, we were able to identify a group of teachers whom we considered to be effective. From this group, twenty-five teachers (8 male and 17 female) with an average age of 44 years were included in the study. Overall they had a mean length of service of 21 years and a mean tenure of 13 years in their current schools, and taught from one of the disciplines of Mathematics, English, History, Social Sciences, Science, Visual Arts, Music and PDHPE (Personal Development, Health and Physical Education).

[3] The Board of Studies is the agency which is responsible for curriculum development and external examinations in schools.

[4] The credential awarded at the end of schooling in NSW is known as the Higher School Certificate (HSC). Each year, about 60,000 students sit for the HSC, the scores from which also form the basis of the most commonly used method of determining university entrance. The HSC requires students to study over a number of areas. Five to six separate subjects are a common pattern of study for these students whose average age is 18 years. In many subject areas, students can choose differing levels or extension courses to suite their abilities. The number of students enrolled in individual courses can by as high as 30,000 for a popular English course, and as low as 10 for some community languages.

Data collection and study results

The teachers were observed teaching a lesson (up to two hours) and then interviewed. In most cases, the researchers were able to interview the observed teacher immediately after the lesson. The interview schedule included questions that asked the teacher to identify successful outcomes of the lesson, and then asked them to consider the strategies they employed. Earlier research (see Brown & McIntyre, 1993; Cooper and McIntyre, 1996) had indicated the benefits of focusing on successful aspects of the lesson. Further questions required the teachers to consider other issues related to the development of pedagogical expertise. During classroom observations, particular teacher behaviours and classroom practices were recorded.

The observational and interview data was then analysed using content analysis. Initially, a list of 'raw' concepts was identified and then grouped together to form categories. A number of categories were identified as important influences on effective HSC teaching. The following points highlight some of the findings associated with specific categories-

- *School Background.* The teachers had positive attitudes towards their schools and also believed that the students had good attitudes and were keen to learn.
- *Subject Faculty* The Faculty's closeness as a team in one form or another was seen as important in contributing to teacher, and hence student, success.
- *Personal Qualities.* Teachers' mastery of content knowledge was seen as crucial in their success. "You've got to know your stuff" was probably the most common answer given in interviews. Content knowledge was seen as a key factor in building student confidence, while a love of, or passion for, the subject was also considered an important key to success, particularly in the motivation of students
- *Relationships with students.* Strong positive classroom relationships were an integral feature of the context against which the teaching strategies to be discussed were enacted
- *Resources and Planning* The planning of both content and teaching strategies were considered key aspect of teaching success. Many teachers emphasised the importance of developing their own resources. Textbooks alone were seen by these teachers as inadequate resources
- *Classroom Climate.* All classes were non-threatening, displaying an excellent relationship between the teacher and the students. Within these relaxed environments there were unspoken expectations that behaviour would be 'on-task', yet acceptable 'off-task' behaviour was tolerated. In-class, face-to-face time was the central learning element, rather than home study or any form of

private individual research. Generally there was no 'dead time" in class and class time was regarded as sacred. In some classes, the sheer speed of topic coverage was noteworthy.

- *HSC Focus*. A number of teachers appeared to create in their classrooms a 'culture' in which the HSC was treated as a kind of game with its own set of rules. Yet, despite this HSC focus, nearly half of the lessons were not considered 'dominated' by the HSC, and, indeed, in some observed lessons there was virtually no reference to the HSC in any form. These teachers were not exam 'crammers', despite the fact that, necessarily, the HSC provided the focus for their teaching. Certainly the HSC exam was a rationale for many of the lessons observed, but even these were not conducted as 'cramming' content for the exams.
- *Teaching strategies*. Most of the lessons observed had two distinct phases. The first phase tended to be heavily teacher directed (see Brophy and Good, 1986; Shulman, 1987) and focused on building links with previous material, assessing student understanding, developing new ideas and concepts and placing these in the context of material already covered. The second phase tended to involve more independent learning and focused on application and problem solving.

Effective teaching and student independence

One of the study's consistent findings was the degree to which the teachers encouraged, and the ways in which they laid the groundwork for, student independence in their classrooms. "Independence" was manifested in a number of senses and achieved through a number of techniques. The following section focuses on five teachers who exemplified many of the general trends associated with developing independence. These teachers taught Mathematics (Male, aged 51, 28 years of service, 20 years in the current school), English (M, 50, 28, 20), Modern History (F, 41, 19, 14), Ancient History (F, 41, 19, 14) and Legal Studies (M, 43, 22, 9).

Note-making and ownership

The concept of "independence" can most usefully be approached by beginning with a discussion of these teachers' attitudes to, and strategies of, note-making. "Independence" was best manifested here in a concept of "ownership". We drew a distinction in the research between what might be termed "note-taking" (the teacher writing up, dictating or otherwise producing notes for the students to directly copy) and "note-making" (the production of notes by the student through means other than copying the teacher's). Almost all teachers indicated that the way students made

notes was important, and along with that went a quite conscious emphasis on students building their own notes. Teachers wanted students to think independently about the issues/problems and didn't want to 'spoon-feed' information. Making notes was an integral part of this process of learning for the students. In a reiterated theme that connected the making of notes to thinking through the content of the lesson, teachers said:

> I want them to find the problems, not just copy notes. If I just put notes on the board, they won't learn anything from them. I never get them to copy slabs of notes - three to four lines at the most. Copying out notes doesn't work. Kids just don't get it if they are just mindlessly copying. I like them to make and fill out their own notes. We don't use the textbook much and never summarise it, partly because the kids are not themselves effective summarisers. If anything needs to be summarised, I'll summarise it for them *(Legal Studies teacher)*

> If I dictate complete sets of notes, they won't learn them. They have to fill in the gaps. I set the structure and they have to follow it up. There is no copying of notes from the blackboard because it just fills in time *(Business Studies teacher)*

> I hand out notes to cover formulae, examples etc, but class time is to be spent in applying the knowledge. I'm not a great note-giver because I'm more concerned that they understand, which doesn't necessarily happen when they're copying notes *(Maths teacher)*

Teachers seemed to believe that student "ownership" of notes maximised student retention and application in the exam situation. In order to guide students towards such independence, teachers reported using strategies such as:

- developing blackboard summaries from student contributions during in-class discussion
- having students build notes from research based on a question they are set
- having students make their own notes based on class discussion
- having students make notes under their guidance, for example, "Focus on..."
- having students make notes based on presentations by other students
- filling in any gaps in student-made notes through class discussion.

In terms of observed lessons, while a few teachers were observed quickly distributing typewritten notes for students to read later, or from which students were to extract information to solve a problem, nevertheless, during our direct observations, no class time was spent with students "note-taking" as we defined it. In fact, the distribution of notes by teachers was always seen by them as a way of supplying necessary information quickly in order to move to having students *do* something with the information. Teachers, moreover, displayed a variety of ways of scaffolding this independent note-making by students. These included:

- making a brief beginning to a set of notes, such as through dictation, and telling students to complete the notes themselves through research or based on the discussion that was about to ensue.
- directed note-making, in which the teacher indicated areas to which students should attend ("Read... underline and make notes on any aspect of the document that suggests why Russia would have trouble sustaining a war"). *(Modern History teacher)*
- allowing time for systematic student note-sharing, such as by breaking a topic into sub-themes and having groups become 'experts' on each sub-theme, followed by sharing of their findings. Student seminar presentations also fell into this area. Generally, teachers would follow this up by having examples of student presentations or assessed tasks or group-work copied for the whole class. One teacher would follow up student seminar presentations instructing students to, "Make notes on three or four points you could add yourself to what you just heard" *(English teacher)*
- having the students review "in their own words" what was covered in class.
- students making their own notes which the teacher later checks and fills in OR selected students read their individual notes back during the lesson and teachers cover any neglected areas. This filling-in of 'gaps' in student notes by the teacher was especially prevalent in History courses.

An observed Legal Studies lesson is a particularly clear example of "ownership". The teacher of this lesson held, and displayed in action, a conscious belief that students should have a fair degree of latitude to even decide what notes to record. His class was told, "Of the definitions we've just produced only copy down those you don't already know. If you know the definition already, don't bother". At one point in this lesson, which was based on introducing litigation terminology, we believed we were about to witness our first case of "note-taking". The teacher used an overhead transparency with a series of summary notes on it, but began with it covered up. He

then asked a series of questions, and when he had the answer he wanted, he would reveal the part of the transparency containing that answer. But he insisted that students only copy what they needed and to leave room for further filling-in during later discussion if something came up that they thought was important. He then gave the students in-class time to make such notes. The overhead transparency effectively became not a source of notes for the students, but a guide to the direction of the lesson. This teacher was adamant that students would simply be bored by having to make notes on any material they already knew and, as much as anything else, this was also clearly a conscious decision about not wasting precious class time.

Interpreting and applying knowledge

Any discussion of building independence in the classroom has to come to terms with views of learning. If a teacher stresses the importance of interpretation and application (rather than simple reproduction of knowledge) for learning, then they are partly sending signals to students that they believe these students to be capable of independent thought in a particular area. In following through on these beliefs, they are then building that independence.

In terms of aiding students' understandings of the subject matter, we classified a large number of classroom strategies under the rubric of 'Building understanding'. This referred to ways in which teachers helped develop students' understanding of subject matter and the most common interview responses entered in this sub-category emphasised the importance of having students apply knowledge, often through solving problems. This element was usually contrasted with copying notes and with being told the answers too readily. It was also linked closely to maximising the use of in-class time and to the inter-relatedness of areas of the subject:

> We do take old knowledge into new realms. I ask, 'Can you apply this elsewhere?' *(Maths teacher - not case study teacher)*

> The most important thing is to be able to apply formulae and to apply a number of methods to solve problems...I want them to think, to look for alternatives. They get bored just practising formulae and I give them sheets for reviewing 'basics' anyway... I hand out notes to cover formulae, examples etc, but class time is to be spent applying the knowledge *(Maths teacher)*

We want kids to struggle with the questions and sort them out themselves, to experience the satisfaction of getting it out, a greater satisfaction than being told *(Maths teacher)*

In class, we want to move away from just applying formulae and work on problem-solving applications *(Maths teacher - not case study teacher)*

My kids talk a lot in order to deduce things from the source material I give them. It's my main mode of working and it's preferable to the teacher telling them *(Ancient History teacher - not case study teacher)*

Every lesson is about asking real questions, not providing answers. The kids are encouraged to talk, have opinions and think *(English teacher)*

In terms of an exemplar, one of the most interesting and useful lessons observed was a Mathematics lesson in which students were asked to apply a new formula they had just learnt. Instead of proceeding to a series of activities in which students would simply practise using this new knowledge, as a first step after deriving the formula this teacher required students to apply the formula to a series of particularly complex two-or three-stage problems. These problems were initially completed as a whole class. In each case, at some point in the solution, material that they had learnt in the past needed to be applied. Moreover, as the solutions were occurring, the teacher would continually complicate the issue by asking, 'But what if it had said ... ?' - the answers to which also depended on the application of some past knowledge. Students in this class were expected to 'jump around' a range of topics and formulae from the past in order to solve complex problems that essentially centred on the new material. In this class, the simple practising of new formulae seemed never to occur - immediate application to a concrete, complex problem was the favoured methodology.

In a later episode of the lesson, students were given a particularly difficult three-step problem to solve alone or in groups. The declared aim of this problem was to deliberately search out variety - the teacher wished to see students finding a number of ways of solving the problem, with a prize going to the most 'elegant' solution. The teacher moved among the students as they worked on the problem, satisfied himself that four students had four different solutions and had these students demonstrate their solutions on the blackboard. The point of this was, again, to display the variety of possibilities, since each solution was correct. The particular relevance here is that each solution drew on knowledge outside this immediate topic and, moreover, as each solution was demonstrated, the teacher would complicate it

even further by asking, 'Now at this stage, what if the question had said ... ?' In each case, the other hypothetical possibility also drew on past topics.

Related to the idea of application, problem-solving and thinking is the emphasis on interpretation, rather than simple reproduction, of knowledge. In a Legal Studies lesson, after a general discussion of crime, students were given copies of the Australian Constitution and had their attention directed to that section dealing with the powers of the Federal government to make laws. Students were asked, in groups to apply the discussion of powers to specific crimes just listed - in effect, to interpret the Constitution to apply to crimes of which they had knowledge. In an Ancient History lesson, students were supplied with pictures of the Palace of Knossos and asked to deduce the purpose of the palace before any information was supplied. In another Ancient History lesson, students were issued with a list of 'Sayings of Greek Women' and asked to deduce the values inherent in the society that produced such a list.

Questioning and scaffolding

Douglas Barnes' (1974) study of teacher questioning in schools argued that "open" questions (those to which there were a number of possible answers) were more likely to promote discussion and maximise student involvement and learning than were "closed" questions (to which there was only one answer). Barnes further found that closed questions predominated in schools and that teachers were forcing their students into playing a game of "guess what's in the teacher's head". This research confirmed Barnes' findings about the predominance of closed questions. In only two lessons (Ancient History and Visual Art) was there a predominance of questions that asked for an interpretative response, and in only two were a range of these question types evident. Eleven lessons - across the curriculum - were dominated by closed questions of a "give-back-to-me-the-information-I-want" type. This might seem a contradiction of our arguments about independence, unless one studies the lesson contexts within which this questioning was embedded, and the ways in which closed questions were rarely used as ends in themselves, but almost always as a lead-in to open-ended tasks.

In one English lesson, the class were studying the Donne poem, "Batter my heart, three-personed God". After a quick overview of where how the lesson would proceed, the teacher followed with a brief, but comprehensive, review of the sonnet form and his own reading of the poem itself. Following this reading, he set the students their own introductory analysis to be done in pairs. The students' task was to re-read the sonnet and to "...get an overall view of the

poem and where any problem areas for your understanding are". As the students worked together in their pairs, the teacher moved among them, asking questions to push them further in their thinking. When they asked questions of him, he answered directly, though this was only the case when students' questions were about the sonnet's form, rather than about the ideas which he had set them to consider. He seemed to insist that the students address this for themselves, and avoided answering questions about what he has called 'theme/ideas/purpose'.

The next stage in the lesson was when the teacher called three students to the front of the room to explain to the rest of class the interpretations they had been considering. He "pushed" them hard about what they'd found: took them through some very open questions in which he kept pushing them to see the consequences of statements they'd just made: "If 'X' is true, what does that mean for 'Y'?". In keeping with the spirit of a Donne religious poem, he had one of the students at the front kneel and simulate praying to capture, as well as discuss, the tone of the poem. He was encouraging, even demanding, prompting the student to stretch his thinking about Donne's demands on God - 'Keep going...' was a constant refrain. But in contrast to this open-endedness, the teacher would turn from the students at the front and then back again with a fast series of questions about the poem which were the very opposite of those earlier, open questions. In fact, without exception, the questions he asked were of the style, 'Guess what's going on inside my head'. At this point he was working in the mode of the Transmission teacher (Barnes, 1976) who sees his job as imposing his view of the subject and who asks only closed questions. The teacher said things like, "Donne's attitudes are very.... what?"; "I'm thinking of a five letter word that sums this up...". Here, the teacher overwhelmingly conveyed the idea that there was one "right" answer to this poem. He then told the students to form back into groups. He reminded them that they had now considered the poem in groups in an effort to register first impressions and then discussed together as a class the first half of the poem in great detail. His instruction now was to re-read the rest of the poem and 'Come up with a theory'.

This teacher displayed very different behaviour according to whether students were working alone (or in groups) or whether he was teaching to the whole class. The former was dominated by a thinking, interpretative, problem-solving, application set of approaches, while the latter was dominated by "Guess what's in the teacher's head" during question-answer sessions. In doing so, this lesson was absolutely typical of our findings. This clearly very

knowledgeable teacher wished to lead students to a moment of revelation about a poem and the questions with which he did so included those very leading prompts. Whole-class question-and-answer sessions, then, seemed to be typically seen by these teachers, and this English teacher is typical of them, as more suitable for:

- assessment of pupils' present state of knowledge
- for linking different aspects of a topic, especially with past material - as a kind of review process, and also as a way of taking pupils to the "big picture" of the subject itself
- and, importantly for the present theme, as providing a base of "understanding" on which to build what we might call "interpretation", or "independent thought"

The expertise of teachers like this one seems to lie in the balance that they find between Transmission and Interpretation, and especially when the pivotal point has arrived to switch the lesson from one mode to the other. In this English lesson, students' own interpretations were encouraged in the open-ended group work episode preceding his closed questioning and the whole-class questioning episode only took students to a certain point in the poem. At that point, the teacher gave students that very open instruction to, "Come up with a theory".

Group work and thinking

Given the kind of time constraints about which teachers complain in Grade 12 examination groups, it would not be unexpected to find teachers avoiding small group work in the classroom. Yet, small group work was more prominent than might have been expected in HSC classes and occurred in a third of observed lessons and in interviews two-thirds of the teachers spoke of using group work as a way of reaching understanding of the material. These interview responses represented a range of subject areas. Different reasons were given for this widespread use of group activities. These specifically included a range of reasons aimed at using the work to create independent thinking among students:

- wanting students to make their own deductions from source material
- wanting students to learn from what they each bring to the subject matter
- wanting students to find for themselves the key problems to be solved.
- wanting students to solve problems, such as by using 'hands-on' concrete materials or by finding alternative solutions, as in Maths.

Group tasks tended to be again dominated by a thinking, interpretative, problem-solving, application set of approaches. The case-study Maths teacher already referred to, after introducing a new fomula, set his class the task of solving the complex problem in groups using the new formula as well as others with which they were familiar. His explicit aim in this was to see how many different solutions the class could find. The Modern History teacher, after supplying a class with a set of tables and other documents based on 1914-16 Russia, asked her class to decide in groups why Russia would not be able to sustain a war. Similarly, the case-study English teacher simply asked groups to, "Come up with a theory".

One crucial aspect of work completed in groups -or individually by students - was the behaviour of teachers while students were working independently. In almost every lesson observed, when students were working alone or on groups, teachers spent their time moving among students providing one-on-one assistance. This in itself is not remarkable, but of interest is the forms which this monitoring took - which tended generally (and paradoxically) to emphasise student independence. Two Ancient History teachers did tend to provide direct answers to student questions on the material they were working on in groups as a way of prompting and assisting students, but of interest to the researchers were the number of teachers who refused to do so. Among the case-study teachers, the Maths teacher would explain concepts and ask questions as he moved among the students, but avoided supplying direct answers to a problem that had been specifically set for students to work on independently. The Modern History teacher would prompt students and ask further questions, but supplied no answers, while the English teacher gave students answers to questions about the form of a poem, but assiduously avoided providing any answers on themes or issues in the poem being studied.

Focus on classroom activity

Paradoxically, these same teachers also downplayed the relative importance of that work which was done outside the classroom, despite its opportunities for independent student work. Interviews stressed the preciousness of in-class time as where the "real work" was done. It seemed to us that the issue of independence was contained within a context - that independent thinking and the real cognitive work of the curriculum was actually most available in the social setting of the classroom. This accords with earlier findings by Barnes that it is those teachers who value social relationships in the classroom who also value higher level intellectual exchange (Barnes, 1976).

Discussion

Overall, many of the observed classroom practices in this study have been reported in other teacher effectiveness research. The teachers had classrooms that were relaxed, pleasant and highly focused. There was little or no 'dead time' and class time was regarded as sacred (see Teddlie, 1994; Brophy & Good, 1986; Borko & Livingston, 1989). Relationships with students were a crucial aspect of these teachers' work (see Brown & McIntyre, 1993; Batten et al., 1993). Teachers alluded to, and practised, a policy of mutual respect in their classrooms and this obviated any necessity for overt disciplinary measures. In nearly all cases, the classes were highly structured and teacher-led (see Brophy & Good, 1986). Questioning, discussion and independent study were all important aspects of lessons (Cooper & McIntyre, 1996; Teddlie, 1994; Brophy & Good, 1986; Borko & Livingston, 1989).

Most of the lessons we observed had two distinct phases. The first phase tended to be heavily teacher directed and focused on building links with previous material, assessing student understanding, developing new ideas and concepts and placing these in the context of material already covered. The second phase tended to involve more independent learning and focused on application and problem solving. Throughout the whole class time, the teachers were constantly involved. While teachers used a wide range of teaching strategies to build student understanding, a key common factor was an emphasis on having students think, solve problems and apply knowledge. Simply reporting back knowledge or practising formulae outside of the context of application was unusual. Teachers strongly saw their role in the classroom as challenging students, rather than 'spoon-feeding' information. They demonstrated ways of building notes and assisted in this process, but were never observed dictating a complete set of notes or having students simply copy notes without a context developed or a lead-up involving student responses. Instead, teachers demonstrated and discussed a variety of ways of helping students to become independent note-makers.

While questioning in the whole-class situation was dominated by closed questions, this contrasted to the strategies teachers used when having students work alone or in groups. In fact, group work was more prominent than might have been expected in HSC classes and was used for a variety of reasons, particularly activities oriented towards problem solving. The closed questions that teachers used in the whole-class situation tended to be used to carefully build understanding of the material in layers and to make links to other aspects of the content. In effect, it served to both look back and look forward in the subject.

The teachers in this study attempted to continue the kind of engagement and understanding one would expect from enlightened educational practice. These successful teachers of the HSC were not exam 'crammers', despite the fact that their

students achieved highly outstanding results. Certainly the HSC exam was a rationale for many of the lessons observed, but these were not conducted as cramming content for the exams. Teachers made strong statements about not being 'exam-driven' where such an approach might prevent deeper student understanding. This finding was in contrast to that of Canadian research (Wideen, O'Shea, Pye & Ivany, 1997) which found that high-stakes examinations restricted the teaching of Science.

To conclude this paper, we recognise that caution needs to be shown in generalising our results, as only a small sample of teachers participated and classroom observations were very limited. However, we believe that the evidence collected suggests that an emphasis on note-making, the complexity of question sequencing and the management of independent work and problem solving, may be crucial factors in effective teaching for this age. The observed teachers all engaged in these activities to some degree. Consequently, how teachers manage the more independent activities within the classroom, especially in their relationship to whole class teaching, may be an important aspect of effective teaching at this level.

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